

the data_science academy

Measuring ROI:
Framework for evaluating
Agent performance and
business impact





crewai Signal 2025



Framework for evaluating agent performance and business impact



21st Nov 2025



9:00am



Thamesmead Library, London,
England | SE28 0EQ

Attendance: **FREE**



Register Now!



luma.com/cp4xxxux



Pablo M.

Professor, Author, AI Product
Manager & Data Scientist

AI Product Manager

board

EdTech Educator / Trainer
the data_science academy



linkedin.com/in/pablo-j-m-g/

Defining ROI for AI

Business Purpose of AI

Business Purpose for AI Agents (the ‘why’)

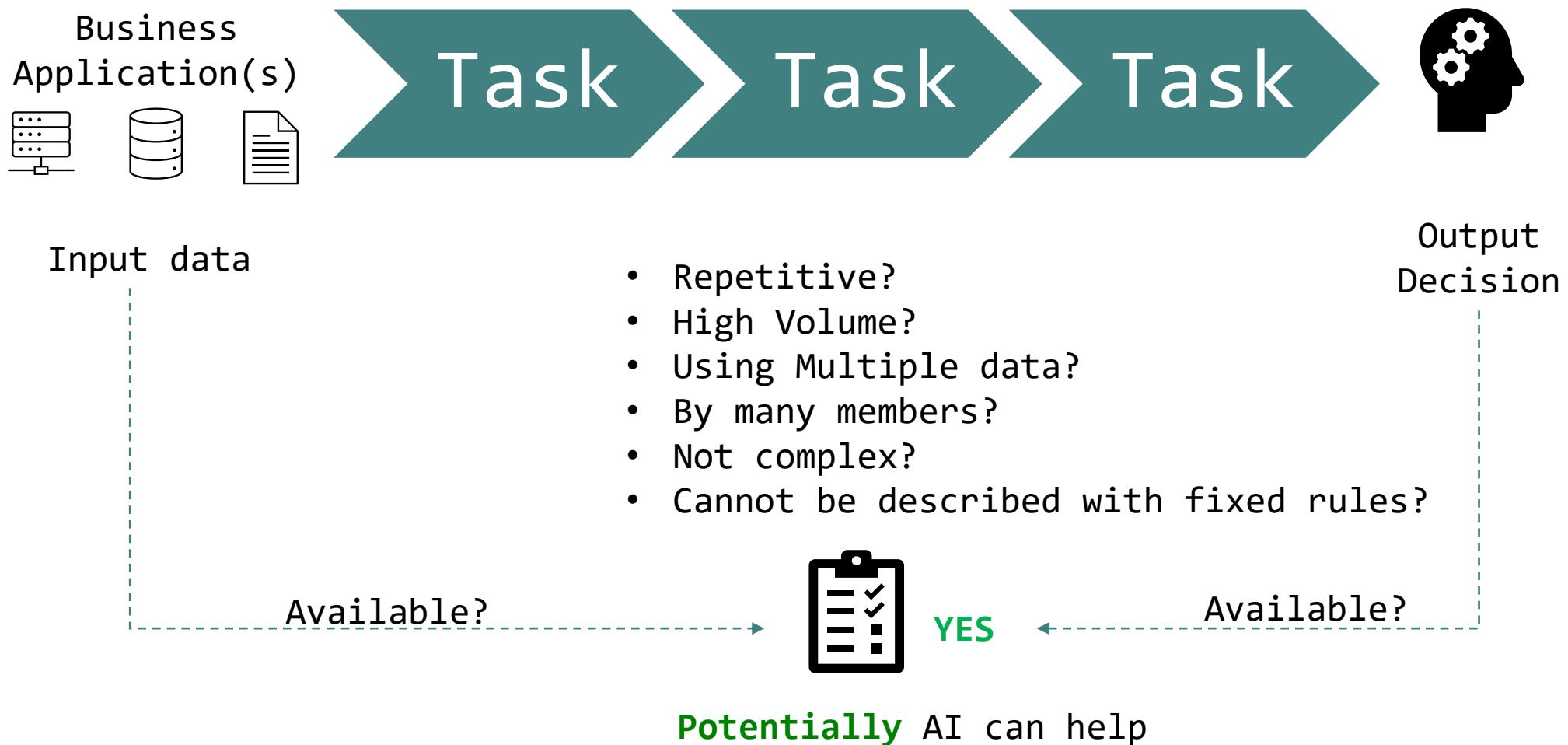
- Improving efficiency
- Reducing operational risk
- Expanding customer impact
- Maximizing revenue generation
- Enhancing decision-making
- Driving innovation

Golden Rule

You may be wanted to achieve **all objectives** at once...
this is guarantee of **failure**

Focus in **1 or 2 (max) objectives** for
one specific AI Agent project.

Common scenario for AI cases



How AI cases can be assessed?



How AI cases can be assessed?

1. Relevance / Business Case

How significant is the need addressed by this use case?

2. Feasibility

How practical is this use case, in terms of implementation?

3. Qualitative data availability

Is access to necessary and qualitative data available?

4. Verifiability of Result

Can the output generated be explained and validated?

5. Risk Propensity

How severe is the risk of inaccurate generations?

6. Compliance

How compliant is this use case with legal and regulatory requirements?

Your biggest enemy?...



Fear Of Missing Out

Measuring Agent Performance

Standard Framework

Framework to Measure Agent performance

1. Identify the Investment

- **Development & Integration:** Model training, customization, API costs.
- **Infrastructure:** Cloud services, hardware, storage.
- **Licensing & Maintenance:** Ongoing support, updates.
- **Training & Change Management:** Educating staff to use the system effectively.

2. Define Measurable Outcomes

- **Cost Reduction:** Automating tasks reduces labor costs.
- **Time Savings:** Faster response times, fewer manual processes.
- **Revenue Impact:** Increased sales through better customer engagement or personalization.
- **Error Reduction:** Lower operational risk and compliance issues.
- **Scalability:** Ability to handle more tasks without proportional cost increase.

Framework to Measure Agent performance

3. Use Proxy Metrics for Intangible Benefits

Some benefits are hard to quantify directly, so use proxies:

- **Customer Satisfaction (CSAT/NPS)** improvements → link to retention/revenue.
- **Employee Productivity** → measure hours saved.
- **Error Rate Reduction** → estimate cost of avoided mistakes.

4. Time Horizon

- AI ROI often improves over time.
- Models learn and improve.
- Adoption increases.
- Fixed costs amortize.

Framework to Measure Agent performance

Calculate ROI

$$\text{ROI} = \frac{\text{Net Benefit}}{\text{Total Investment}} \times 100$$

Where:

Net Benefit = (Financial gains + cost savings + productivity gains) - (Total investment).

Framework to Measure Agent performance

Investment Components

- **Initial Costs**

Development, integration, licenses.

- **Operational Costs**

Cloud hosting, maintenance, updates.

- **Training Costs**

Staff onboarding, change management.

Category	KPI	Formula
Cost Savings	Labor Cost Reduction	(Hours automated × Avg hourly wage)
Operational Risk	Error Cost Avoidance	(Error reduction × Avg cost per error)
Revenue Impact	Upsell/Conversion Increase	(New conversions × Avg deal value)
Productivity	Time Saved per Employee	(Hours saved × Employees × Hourly wage)
Customer Impact	CSAT/NPS Improvement	Proxy for retention/revenue
Scalability	Cost per Interaction	(Total cost ÷ # interactions)

Business Outcome

Translating KPIs to Business Outcome

Framework to Measure Agent performance

Labor Cost Reduction → Lower OPEX

Error Reduction → Compliance & Risk Mitigation

CSAT/NPS → Higher Customer Retention → Increased LTV

Faster Response → Competitive Advantage

Another Golden tip (rule)...

Avoid killing ROI over time with Agent Observability



When AI Agent is developed

AI Agent not maintained



AI Agent well maintained

Agent Observability tools (CrewAI)





info@thedataacademy.academy

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[1] from the_data_science_academy import *
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Out: Upskill Workforce. Reduce turnover. Increase Productivity